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S92	2	("20050077355").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/05/17 12:06
S93	2	("6457647").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/05/17 12:13
S94	8	(("5752857") or ("6438638") or ("6718274") or ("6954461")). PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/05/17 12:14
S95	8	(("5752857") or ("6438638") or ("6718274") or ("6945461")). PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/05/17 12:14
S96	2	("20040133712").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/05/17 12:17
S97	18077	PCMCIA	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2006/05/18 08:03
S98	24	non-PCMCIA	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2006/05/17 18:34

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S99	42	expresscard	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2006/05/18 10:30
S100	2	expresscard with (adapter$2 or adaptor$2)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2006/05/18 06:54
S101	18	expresscard with interface	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2006/05/18 07:20
S102	2	("6122175").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/05/18 07:20
S103	18125	PCMCIA	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2006/05/18 08:03
S104	42	expresscard$2	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2006/05/18 12:20
S105	23	S103 and S104	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2006/05/18 08:03
S106	1	S104 and (passive or passive-card$2)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2006/05/18 08:35

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S107	42	expresscard	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2006/05/18 10:30
S108	16	S107 and detect$3	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2006/05/18 10:30
S109	42	expresscard$2	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2006/05/18 12:20
S110	5	S109 and pci bus	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2006/05/18 12:55
S111	3158	PC Card and PCMCIA	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2006/05/18 12:55
S112	9	S111 and (expresscard$2 or express card$2)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2006/05/18 13:05
S113	1578	PCMCIA and (mux or multiplexer)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2006/05/18 13:05
S114	358	richo.as.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/19 11:17

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S115	236255	ricoh.as.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/19 11:17
S116	51	S115 and PCMCIA	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/22 08:57
S117	315	PCMCIA and PC Card with adapter$2	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/22 09:11
S118	129	PCMCIA and PC Card with adapter$2 same standard$2	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/22 09:14
S119	22	PCMCIA and PC Card with adapter$2 same (USB or universal serial bus or PCI-e or PCIExpress)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/22 09:25
S120	248	pc card with (usb or universal serial bus) with port$2	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/22 09:26
S121	11	S120 and "710"/$.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/22 09:27
S122	4	pc card near3 host$3 near2 (usb or universal serial bus)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/22 09:28

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S123	188	pc card near3 (usb or universal serial bus)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/22 09:29
S124	0	pc card near3 (usb or universal serial bus) near4 hub$2	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/22 09:29
S125	3	pc card near3 (usb or universal serial bus) with hub$2	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/22 09:29
S126	336	(pc card$2 or cardbus$2) near4 (usb or universal serial bus$2)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/22 09:37
S127	325	(pc card$2 or cardbus$2 or PCMCIA) with (usb or firewire) port$2	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/22 09:39
S128	22	S127 and "710"/$.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/22 09:43
S129	22	cardbay	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/23 10:07
S130	182	passive (card$2 or adapter$2)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/23 14:28

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S131	56	S130 and (pcmcia or cardbus or expresscard or pc card)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/22 10:05
S132	41	S131 and detect$3	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/23 08:04
S133	30	NEWCARD	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/22 10:52
S134	26	(US-20050066102-$ or US-20050251609-$ or US-20050233643-$ or US-20040039854-$ or US-20050198399-$ or US-20040133712-$ or US-20060054696-$ or US-20050114587-$ or US-20030112567-$ or US-20050182881-$ or US-20050240713-$ or US-20030038177-$).did. or (US-6760248-$ or US-5930496-$ or US-5920731-$ or US-6438638-$ or US-7008240-$ or US-6718274-$ or US-6898766-$ or US-7044767-$ or US-6945461-$ or US-6970964-$ or US-6470284-$ or US-6807597-$ or US-6839864-$).did. or (US-20050138288-$).did.	US-PGPUB; USPAT; DERWENT	ADJ	ON	2006/05/22 11:12
S135	17	S134 and detect$3	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/22 11:13

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S136	12	S135 and switch$3	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/22 11:13
S137	774	usb with (cardbus or pc card)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/22 19:07
S138	133	S137 and (switch$3 with circuit$3)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/22 19:06
S139	6	usb hub with (cardbus or pc card)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/22 19:07
S140	7	(("20030038177") or ("6832281") or ("6684283")).PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/05/23 08:53
S141	22	cardbay	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/23 10:59
S142	4	(("6470284") or ("6438638")).PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/05/23 11:00
S143	4	(("5918028") or ("5671368")).PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/05/23 11:17

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S144	373	switch$3 with bus near2 standard$2	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/23 11:18
S145	48	S144 same card$2	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/23 11:19
S146	218	switch with bus near2 standard$2	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/23 11:18
S147	27	S146 same card$2	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/23 11:19
S148	17	S146 with card$2	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/23 11:21
S149	279	(PC Card or PCMCIA or cardbus) same standard$2 same switch	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/23 11:23
S150	194	(PC Card or PCMCIA or cardbus) with standard$2 same switch	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/23 11:23
S151	53	(PC Card or PCMCIA or cardbus) with standard$2 with switch	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/23 11:23

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S152	31	(US-20040133712-$ or US-20040039854-$ or US-20050066102-$ or US-20050233643-$ or US-20030112567-$ or US-20050182881-$ or US-20050240713-$ or US-20050251609-$ or US-20030038177-$ or US-20060054696-$ or US-20050114587-$ or US-20050198399-$ or US-20030172263-$ or US-20040059860-$).did. or (US-6898766-$ or US-6760248-$ or US-7044767-$ or US-5920731-$ or US-5930496-$ or US-6470284-$ or US-6839864-$ or US-6945461-$ or US-7008240-$ or US-6970964-$ or US-6438638-$ or US-6807597-$ or US-6718274-$ or US-6684283-$ or US-6832281-$ or US-6604152-$).did. or (US-20050138288-$).did.	US-PGPUB; USPAT; DERWENT	ADJ	ON	2006/05/23 14:27
S153	4	S152 and regulat$3	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/23 14:27
S154	182	passive (card$2 or adapter$2)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/23 14:28
S155	15	S154 and regulat$3	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2006/05/23 14:29

PCMCIA 16 bit Bus

PC Card
Personal Computer Memory Card International Association

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PC Card Description

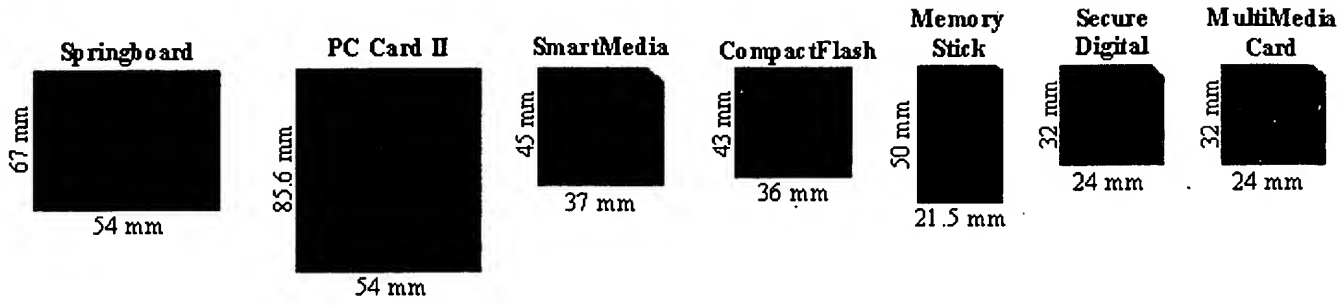
The PCMCIA [**PC Card**] specification defines both the Electrical and Physical specifications for a 68 pin interface residing in one of 3 form factors, which differ only in thickness;
Type I: dimensions 3.3mm x 85.6mm x 54.0mm (TxLxW), Version 2.1 allows the length to increase 50mm to 135mm
Type II: dimensions 5.0mm x 85.6mm x 54.0mm (TxLxW), Version 2.1 allows the length to increase 50mm to 135mm
Type III: dimensions 10.5mm x 85.6mm x 54.0mm (Tall x Length x Width)

In most cases cards designed to the PCMCIA specification are used on laptop computers. The smaller size of the PCMCIA card can be used to implement normal desktop expansion boards into a smaller form factor which may be inserted into a notebook computer. PCMCIA cards are commonly used as memory expansion [physical memory, or hard disk drive], modem, or other uses. In some case PCMCIA slots are also provided on desk top computers.

The implementation of this spec based on the ISA bus is termed the **PC Card** with a 8/16 bit data bus, 26 address lines, and no bus mastering. PC Card-16 cards use an 8-bit or 16-bit interface that operates at ISA bus speeds (10 MHz) using an ISA-like asynchronous protocol. It's called CardBus when implementing the local PCI bus (32 data bits only). All of the PCMCIA implementations use Plug and Play and have Hot Swapping capabilities. The 16-bit PCMCIA 'PC Card' will operate up to a maximum of 20MBps, or 160Mbps. However the actual throughput will depend on the minimum cycle time and the transfer mode [Byte/Word] and will never reach the maximum throughput rates.

Miniature Card is a smaller implementation of PCMCIA. Miniature Cards dimensions 3.5mm x 33mm x 38mm (Tall x Length x Width). The electrical specifications are a subset of the PC Card standard, restricted to memory applications only. It uses a 16-bit data bus and a 24-bit address bus to allow a single card to store up to 64MB.

The PCMCIA 'PC Card' standard [discussed on this page] should not be used as an up-grade because it's based on the slower ISA bus standard. Use the Cardbus standard of PCMCIA instead, which is based on the PCI bus specification. The PCI implementation in Cardbus is much faster, and a newer bus standard. I've heard that version 2 [1991] of the PCMCIA standard was not widely followed or was not well defined. Version 2.1 [1993] addressed some of the standards issues, but may still have issues with standardization. The PCMCIA 'PC Card' bus is obsolete, and should not be used for new designs. At a minimum use the PCI version of the bus discussed above. Removable memory cards are produced in a number of different formats



The figure provides a comparison of different types of flash memory cards and the PC Card format. For additional information on other flash memory board standards refer to the Personal Computer Buses page.

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PCMCIA Standard Organizations

The PC Card specification was released in 1990, version 2.0 in 1991, version 2.1 in 1993, version 5.0 in 1995, version 8.0 released in 2001

PCMCIA {PCMCIA.org, Personal Computer Memory Card International Association}

{PC Card Index}

PCMCIA Bus Interface ICs

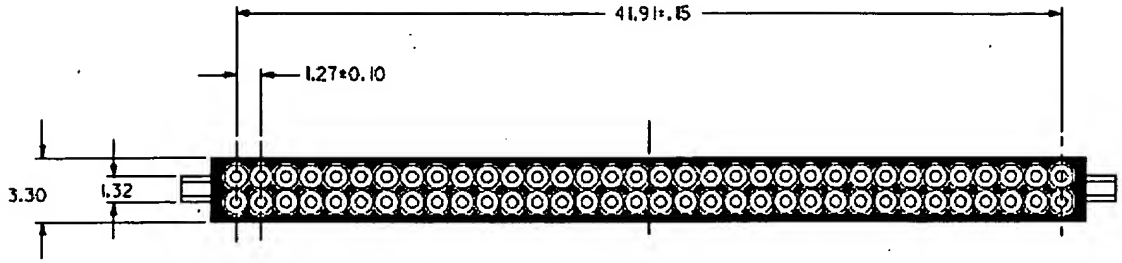
No IC manufacturers are listed because this interface is out-dated. The PC Card standard has been replaced by the CardBus standard, and ExpressCard standard. Use the link below to search for IC manufacturers.

IC Manufacturers {All other types}

{PCMCIA PC-Card Index}

PCMCIA Connector Manufacturers

The PC Card uses a 68 pin connector, with two rows of 34 pins, with 0.05 inch spacing [1.27mm]. Female pins are used on the card side, male pins on the system end. The power and ground pins are longer than the signal lines, allowing them to make connect first.



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PC Card, Pin Out

The table provides the pinout for the 16-bit PC Card.

PCMCIA 68-pin Connector Pin Out And Signal Names

Pin #	Signal Name	Pin #	Signal Name	Pin #	Signal Name	Pin #	Signal Name	Pin #	Signal Name
1	Ground	15	WE	29	A0	43	VS1/RFSH	57	VS2/RFU
2	D3	16	Ready	30	D0	44	Reserved	58	Reset
3	D4	17	Vcc	31	D1	45	Reserved	59	Wait
4	D5	18	Vpp1	32	D2	46	A17	60	Reserved
5	D6	19	A16	33	Wp	47	A18	61	Reg
6	D7	20	A15	34	GND	48	A19	62	BVD2
7	CE1	21	A12	35	GND	49	A20	63	BVD1
8	A10	22	A7	36	CD1	50	A21	64	D8
9	OE	23	A6	37	D11	51	Vcc	65	D9

10	A11	**24**	A5	**38**	D12	**52**	Vpp2	**66**	D10
11	A9	**25**	A4	**39**	D13	**53**	A22	**67**	CD2
12	A8	**26**	A3	**40**	D14	**54**	A23	**68**	GND
13	A13	**27**	A2	**41**	D15	**55**	A24	--	---
14	A14	**28**	A1	**42**	CE2	**56**	A25	--	---

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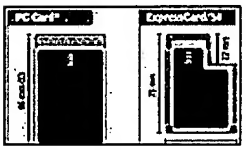

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The standard PC Card slot that has been found on the sides of notebooks since 1991 is wearing out its welcome. The PC Card has finally been surpassed by faster technologies, such as Gigabit Ethernet and FireWire. And the increasingly popular HDTV would choke on PC Card throughput.

Enter ExpressCard, a smaller, faster, cheaper solution. ExpressCard will have the theoretical maximum throughput to transfer data at a whopping 250 MBps (actually, 500 MBps total; 250 MBps to the computer in one direction and 250 MBps to the card in the other). This is in comparison to the now seemingly sluggish 132-MBps PC Card standard.

ExpressCard's throughput is ideal for video transfers and uncompressed files. To compare it with throughputs you're familiar with: Gigabit Ethernet has a throughput of 125 MBps, FireWire 800 (seen only in new Apple notebooks so far) runs at 100 MBps, and USB 2.0 can reach 60 MBps.

Same but Different

There will be two sizes of ExpressCards, varying only by width: ExpressCard/34 (34 mm wide) and ExpressCard/54 (you guessed it: 54 mm wide). They'll both be 5 mm thick, as is the popular Type ii pc Card. Two ExpressCard/34s or one ExpressCard/54 will fit into a slot not much wider than the one a single PC Card occupies today.

There's no mechanical ejector button like the ones on PC Card slots, which tend to snag and break. Instead, an ExpressCard will jut out a little over half an inch, so you can easily pull it out with your fingers.

We Go Together

ExpressCard can't attain its top speed of 250 MBps without the upcoming

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PCI Express bus technology. This has the same bandwidth potential as ExpressCard: 250 MBps in each of two directions, reaching up to 4 GBps in future iterations. It succeeds PCI, which topped out at 132 MBps (total, both directions).

The ExpressCard specification requires connection compatibility with USB 2.0, which is standard on most current notebooks. This will be handy for external USB readers used with older notebooks. And a PC Card adapter for ExpressCard/34 only will be available for notebooks with PC Card slots.

On notebooks, PCI Express will be part of the upcoming Intel Alviso chipset. But some notebook manufacturers predict that systems containing all three—Alviso, PCI Express, and ExpressCard—won't be available until early 2005.

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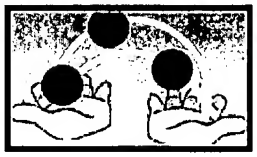

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PCMCIA ExpressCard

Personal Computer Memory Card International Association

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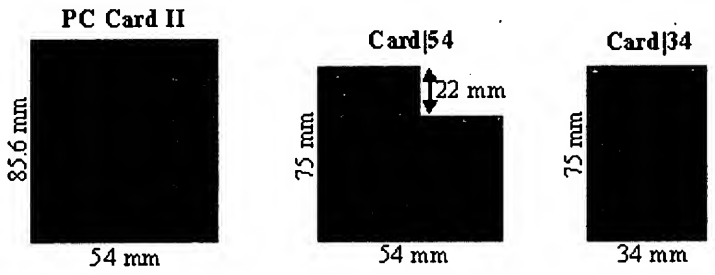
ExpressCard Description

ExpressCard Defines both the Electrical and Physical specifications. PCMCIA ExpressCard "Newcard" is the new form factor for PCMCIA Circuit Cards and will utilize either the USB or PCI Express buses. The ExpressCard add-in card may also utilize both the USB and PCIe interfaces on the same card. The new single width card is 34mm x 75mm. The double width card is 54mm x 74mm (has a 22mm notch). The single card is called ExpressCard/34, and the double width card is called ExpressCard/54. Both cards are 5mm high. Both card types will fit into a larger socket, while only the smaller card will fit into a small socket



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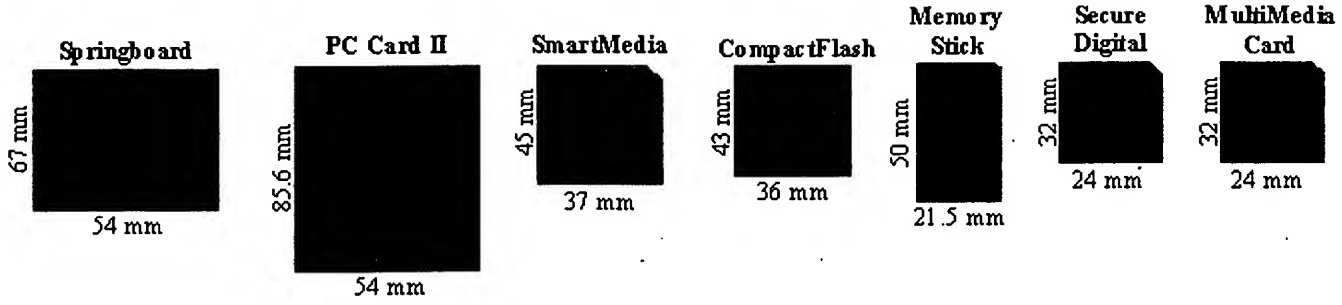
Older PCMCIA formats include:

Type I: 3.3mm x 85.6mm x 54.0mm (TxLxW), Version 2.1 allows the length to increase 50mm to 135mm
Type II: 5.0mm x 85.6mm x 54.0mm (TxLxW), Version 2.1 allows the length to increase 50mm to 135mm
Type III: 10.5mm x 85.6mm x 54.0mm (TxLxW)

CardBus implements the PCI bus (32 data bits only). CardBus operates over 32 bits at 33MHz [multiplexed address/data path]. The peak data transfer rate is 132MBps [synchronous burst-transfer orientation]. CardBus only uses 3.3v V_{CC} as the power supply.

PC Card implements the ISA bus. A 8/16 bit data bus, 26 address lines, no bus mastering operating at speeds (8 MHz) using an ISA-like asynchronous protocol.

Miniature Card is a smaller implementation of PCMCIA. Miniature Cards dimensions are: 3.5mm x 33mm x 38mm (TxLxW). The electrical specifications are a subset of the PC Card standard, restricted to memory applications only. It uses a 16-bit data bus and a 24-bit address bus to allow a single card to store up to 64MB.



{ExpressCard Index}

ExpressCard Standard Organizations

PCMCIA {PCMCIA.org}

{ExpressCard Index}

ExpressCard Bus Interface ICs

The ExpressCard interface uses both the USB interface and the PCI Express buses. Refer to either of those pages for the electrical interface and IC manufacturers. ExpressCard modules receive their power over the connector from the host system [PC]. The listing of devices below cover Power switches and power controller ICs to provide Power management.

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{ExpressCard Index}

ExpressCard Connector Manufactures

ExpressCard uses a 26 position connector which supports both the USB interface and the PCI Express buses. The 26-pin connector is used for both modules formats; ExpressCard/34 module, and ExpressCard/54 module. The ExpressCard uses a beam-on-blade style connector.

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Tyco {26-position card connector and a surface mount, 26-position right angle host connector.}

{PCMCIA ExpressCard Index}

ExpressCard, PinOut

ExpressCard Interface Signal Assignments (26-Pin Pinout)

ExpressCard Connector Pin Out

Pin #	Signal Name	Pin Function	Pin #	Signal Name	Pin Function

Engineering Design Key words: PCMCIA, Personal Computer Memory Card International Association, ExpressCard, PC Card, Interconnect, Electrical layer, Standard, Interface Standard Data Bus, Standard, Specification, Spec, Products, Interface, IC, Physical Interface, Description, Manufacturer, Personal Computer, PC, Pin-out, Pinout, Connector Pins, Add-in, Modules.

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PCMCIA 32 bit Bus

Personal Computer Memory Card International Association

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CardBus Description

PCMCIA Defines both the Electrical and Physical specifications for a 68 pin interface residing in one of 3 form factors, which differ only in thickness;

Type I: 3.3mm x 85.6mm x 54.0mm (TxLxW), Version 2.1 allows the length to increase 50mm to 135mm
Type II: 5.0mm x 85.6mm x 54.0mm (TxLxW), Version 2.1 allows the length to increase 50mm to 135mm
Type III: 10.5mm x 85.6mm x 54.0mm (TxLxW)

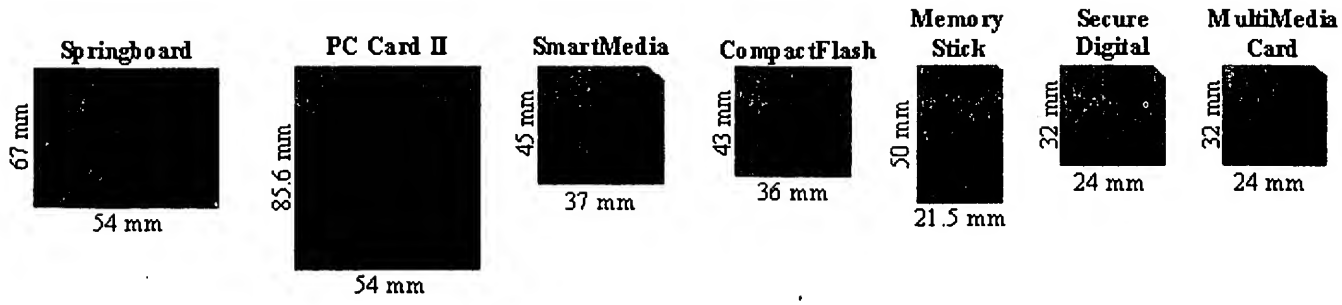
It's called **CardBus** when implementing the local PCI bus (32 data bits only). CardBus operates over 32 bits at 33MHz [multiplexed address/data path]. The peak data transfer rate is 132MBps [synchronous burst-transfer orientation]. **CardBus** Uses only 3.3v V_{CC} as the power supply. Cardbus devices may act as either [System-Bus] Master or Slave, while 16-bit PC Card devices may only act as slaves. CardBus is fully backward compatible with the older PCMCIA [PC-card design]; however there may be some compatibility issues with the early versions of the PCMCIA standards. The implementation of this spec based on the ISA bus is termed the PC Card A 8/16 bit data bus, 26 address lines, no bus mastering operating at ISA Bus speeds (8 MHz) using an ISA-like asynchronous protocol. How ever CardBus offers newer technology with a faster and wider bus, providing higher through-put.

Miniature Card is a smaller implementation of PCMCIA. Miniature Cards dimensions are: 3.5mm x 33mm x 38mm (TxLxW). The electrical specifications are a subset of the PC Card standard, restricted to memory applications only. It uses a 16-bit data bus and a 24-bit address bus to allow a single card to store up to 64MB.

CardBus Applications: Memory Card, Modem [RJ11 interface] Card, Wireless Interface, Ethernet Interface [RJ45], CompactFlash card reader [with a adaptor]

PCMCIA Bus Overview {Quatech}

PCMCIA Primer {Accurite Technologies Inc.}



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{CardBus Index}

PCMCIA Connector Manufactures

PCMCIA devices; both CardBus and PC card use a 68 pin connector, with two rows of 34 pins, @ 0.05 inch spacing. Female pins are used on the card side. The power and ground pins are longer than the signal lines, allowing them to make connect first.

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{PCMCIA Cardbus Index}

Cardbus, PinOut

CardBus Interface Signal Assignments (Pinout)

CardBus Connector Pin Out

Pin #	Signal Name	Pin Function	Pin #	Signal Name	Pin Function
1	Ground	----	35	GND	Ground
2	CAD0	Address/data bit 0 , I/O	36	CCD1	Card Detect 1
3	CAD1	Address/data bit 1, I/O	37	CAD2	Address/data bit 2, I/O
4	CAD3	Address/data bit 3, I/O	38	CAD4	Address/data bit 4, I/O
5	CAD5	Address/data bit 5, I/O	39	CAD6	Address/data bit 6, I/O
6	CAD7	Address/data bit 7, I/O	40	RFU	Reserved for future use
7	CC/BE0	Byte Enable, I	41	CAD8	Address/data bit 8, I/O
8	CAD9	Address/data bit 9, I	42	CAD10	Address/data bit 10, I/O
9	CAD11	Address/data bit 11, I/O	43	CVS1	---, I
10	CAD12	Address/data bit 12, I	44	CAD13	Address/data bit 13, I/O
11	CAD14	Address/data bit 14, I	45	CAD15	Address/data bit 15, I/O
12	CC/BE1	Byte Enable 1, I	46	CAD16	Address/data bit 16, I/O
13	CPAR	Parity Bit, I	47	RFU	Reserved for future use
14	PERR	Parity Error, I	48	CBCLOCK	--
15	CGNT	Bus arbitration grant, I	49	CSTOP	--
16	CINT	Ready/Bus , O	50	CDEVSEL	Device Select
17	Vcc	Supply Voltage	51	Vcc	--
18	Vpp1	Programming Voltage 1	52	Vpp2	Programming Voltage 2
19	CCLK	Bus clock, 0 to 33MHz	53	CTRDY	--
20	CIRDY	Ready, I	54	CFRAME	Data Frame indicator
21	CC/BE2	Byte enable 2, I	55	CAD17	Address/data bit 17, I/O

22	CAD18	Address/data bit 18, I/O	**56**	CAD19	Address/data bit 19, I/O
23	CAD20	Address/data bit 20, I/O	**57**	CVS2	--
24	CAD21	Address/data bit 21, I/O	**58**	CRST	Reset
25	CAD22	Address/data bit 22, I/O	**59**	CSERR	System Reset
26	CAD23	Address/data bit 23, I/O	**60**	CREQ	Arbitration Request
27	CAD24	Address/data bit 24, I/O	**61**	CC/BE3	Byte Enable 3
28	CAD25	Address/data bit 25, I/O	**62**	CAUDIO	Card Audio Output, O
29	CAD26	Address/data bit 26, I/O	**63**	CSTSCHG	--
30	CAD27	Address/data bit 27, I/O	**64**	CAD28	Address/data bit 28, I/O
31	CAD29	Address/data bit 29, I/O	**65**	CAD30	Address/data bit 30, I/O
32	RFU	Reserved for future use	**66**	CAD31	Address/data bit 31, I/O
33	CCLKRUN	--, O	**67**	CCD2	Card Detect 2
34	GND	Ground	**68**	GND	Ground

The Cardbus pinouts are defined for a 68 pin connector; 2 rows of 34 pins. From the table above:
I: is Input, toward the card
O: is Output, output from the card
I/O: is Input or Output, bidirectional to-and-from the card

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Engineering Design Key words: PCMCIA, Personal Computer Memory Card International Association, CardBus, PC Card, Interconnect, Electrical layer, Standard, Interface Standard Data Bus, Standard, Specification, Spec, Interface, IC, Physical Interface, Description, Manufacturer, Personal Computer, PC, Pin assignment, Pin-out, Pinout, Connector Pins

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